

**DEPARTMENT OF TRANSPORTATION**

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



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Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 1.28**WELDING INSPECTION REPORT****Resident Engineer:**Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-018712**Date Inspected:** 13-Dec-2010**Project Name:** SAS Superstructure**OSM Arrival Time:** 630**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1500**Contractor:** American Bridge/Fluor Enterprises, a JV**Location:** Job Site**CWI Name:** See Below**CWI Present:** Yes No**Inspected CWI report:** Yes No N/A**Rod Oven in Use:** Yes No N/A**Electrode to specification:** Yes No N/A**Weld Procedures Followed:** Yes No N/A**Qualified Welders:** Yes No N/A**Verified Joint Fit-up:** Yes No N/A**Approved Drawings:** Yes No N/A**Approved WPS:** Yes No N/A**Delayed / Cancelled:** Yes No N/A**Bridge No:** 34-0006**Component:** Orthotropic Box Girders**Summary of Items Observed:**

At the start of the shift the Quality Assurance Inspector (QAI) traveled to the project site and observed the following work performed by American Bridge/Fluor Enterprises (AB/F) personnel at the locations noted below:

- A). Deck Access Hole
- B). Field Splice E8/E9
- C). Pipe Supports
- D). QC Inspection Request

**A). Deck Access Hole**

The QAI observed the welder, Xiao Jian Wan ID-9677, perform the CJP welding of the Deck Access Hole- Insert Plate (DAH-IP) identified as Weld Number (WN): 8E-PP61.5-E2-SE located on the "A" deck of the Orthotropic Box Girder (OBG) E8. The welding was performed utilizing the SMAW process as per the Welding Procedure Specification (WPS) ABF-WPS-D15-1010, Rev. 1. The WPS was also utilized by the QC inspector, Jesse Cayabyab, as a reference to monitor the welding and to verify the welding parameters which was recorded as 159 amps by the QC inspector. The 4.0 mm low hydrogen electrode, E7018 H4R, was utilized with the welding performed in the flat (1G) position with work placed in an approximately horizontal plane and the weld metal deposited from the upper side.

The groove joint appeared to comply with the AWS joint designation identified as B-U4a and the minimum preheat temperature of 65 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius were verified by the QC inspector. The work performed appeared to comply with the contract documents.

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The QAI observed the welder, Jin Quan Huang ID-9340, perform the CJP welding of the Deck Access Hole-Insert Plate (DAH-IP) identified as Weld Number (WN): 4W-PP24.5-W5-SW located on the "A" deck of the Orthotropic Box Girder (OBG) W4. The welding was performed utilizing the SMAW process as per the Welding Procedure Specification (WPS) ABF-WPS-D15-1010, Rev. 1. The WPS was also utilized by the QC inspector, Jesse Cayabyab, as a reference to monitor the welding and verify the welding parameters which was recorded as 150 amps by the QC inspector. The 3.2 mm low hydrogen electrode, E7018 H4R, was utilized with the welding performed which was performed in the flat (1G) position with work placed in an approximately horizontal plane and the weld metal deposited from the upper side. . The groove joint appeared to comply with the AWS joint designation identified as B-U4a and the minimum preheat temperature of 65 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius were verified by the QC inspector. The work performed appeared to comply with the contract documents.

### B). Field Splice E8/E9

The QAI also observed the Flux Cored Arc Welding (FCAW-G) of the weld joint identified as Weld Number (WN) 8E-9E-C1 and C2. The Complete Joint Penetration (CJP) welding was performed by welding personnel Song Tao Huang, ID-3794 utilizing the WPS ABF-D15-3042B-1, Rev. 0. The WPS was also used by the QC inspector Fred Von Hoff as a reference to monitor the welding and to verify the DC welding parameters which were noted and recorded by the QC as follows; 235 amps, 23.0 volts and a travel speed measured at 250 mm/m. The welding was performed in vertical position (3G) at approximate incline of 22 degrees with the weld progression up. The QC inspector also verified the minimum preheat temperature of 100 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius. Later during the shift the QAI observed, at random intervals, the QC inspector monitoring the in process welding, the surface temperatures and verifying the welding parameters. The CJP welding was not completed during this shift.

The QAI observed the excavation of the unacceptable discontinuity on the deck plate field splice identified as WN: 8E-9E-A2, repair cycle # 2. The rejectable discontinuity was discovered during the Ultrasonic Testing (UT) performed by the QC technician, Steve McConnell and appeared to run in the transverse direction of the longitudinal weld. The excavation was performed by welding personnel Wai Kitlai ID-2953 utilizing a high cycle grinder to remove the defects and a rotary file to bring the excavated area into compliance with the Weld Procedure Specification (WPS) ABF-WPS-D15-1001 Repair, Rev. 0. At the conclusion of the excavation the QC inspector, Steve McConnell, performed a visual inspection and a Magnetic Particle Test (MPT) of the areas and no rejectable indications were noted. At this time the welder commenced the repair welding utilizing the Shielded Metal Arc Welding (SMAW) process as per the WPS which was also utilized by the QC inspector to monitor the welding and to verify the DC welding parameters. The QC inspector verified the DC welding parameters as 127 amps and the minimum preheat temperature 65 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius which appeared to comply with the contract documents. Prior to the welding the QAI verified the dimensions of the excavation and were noted and recorded as follows; Y=2820 mm, L=155 mm and d=14 mm. The welding and the QC inspection of this excavation was completed during this shift.

### C). Pipe Supports

The QAI observed the field fit-up and tack welding of the pipe supports along the W5 grid line located on top side

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of the OBG W7 "A" deck. The QC inspection was performed by Mike Johnson utilizing the WPS to monitor the welding and to verify the welding parameters. The tack welding was performed by the welder, Rick Kiikvee, utilizing E7018H4R, 2.4 mm electrodes, in horizontal (2F) and vertical (3F) position, as per the Welding Procedure Specification (WPS) identified as Fillet Murex. The QAI also observed Mr. Johnson verifying the welding parameters and were recorded as 97 amps.

### D). QC Inspection Request

At the request of Quality Control Field Supervisor, Bonifacio Daquinag, the QAI randomly verified the visual appearance of the Complete Joint Penetration (CJP) welding of the following; WN: 6E-PP37.5-E2-LS-East and West, WN: 6E-PP37.5-E2-TS. Later in the shift, Mr. Daquinag issued a second request for the following overhead (4G) CJP welds; Deck Access Hole (DAH) identified as WN: 4E-PP11-E3, Weld No. 3 and 4E-PP25-E3-Weld No.2 and Weld No. 4. The QAI verification was performed to verify that the welding and visual inspection performed by the QC inspectors, Patrick Swain, meet the requirements of the contract documents.

At the conclusion of the QAI verification it appeared that the welds and the QC inspection complies with the contract documents.

### QA Observation and Verification Summary

The QA inspector observed the QC activities and the welding of the field splices utilizing the WPS as noted above, which appeared to be posted at the weld station. The welding parameters and surface temperatures were verified by the QC inspector and utilizing a Fluke 337 clamp meter for the electrical welding parameters and a Fluke 63 IR Thermometer for verifying the preheat and interpass temperatures. The ESAB consumables utilized for the SMAW welding process appeared to comply with the AWS Specification and AWS Classification. The QC inspection, testing and welding performed on this shift appeared to be in general compliance with the contract documents. At random intervals, the QAI verified the QC inspection, testing, welding parameters and the surface temperatures utilizing various inspection equipment and gages which included a Fluke 337 Clamp Meter and Tempilstik Temperature indicators.

At approximately 1030 this QAI attended an on-site meeting regarding the means of measuring the 2 1/2 to 1 transition located at the planar misalignments that occurred at the Orthotropic Box Girders (OBG) "A" deck field splices. ABF proposed to utilize a measuring tape to measure the width of the weld face utilizing as a reference 15mm. This dimension was determined utilizing the 6mm misalignment multiplied by 2 1/2. At the conclusion of the meeting it was determined that one of two following methods may be utilized; 1). measuring tape 2) or other suitable measuring devices.

Attendees: Structural Materials Representatives; Pat Lowry, Paul Jefferson and Nicolai Hzass.

American Bridge/Flour Representatives; John Callahan and Leonard Cross.

At the conclusion of the meeting this QAI observed and verified the 2 1/2 to 1 transition at the various misalignments as indicated on the Offset Map and Planar Misalignment Map provided by ABF/Flour Quality Control department. This was as a joint measuring venture between this QAI and QC Supervisor Leonard Cross and QC inspector, Mike Johnson. This task was completed on the east bound OBG's E1 through E8 and appeared to comply with the 2 1/2 to 1 transition.

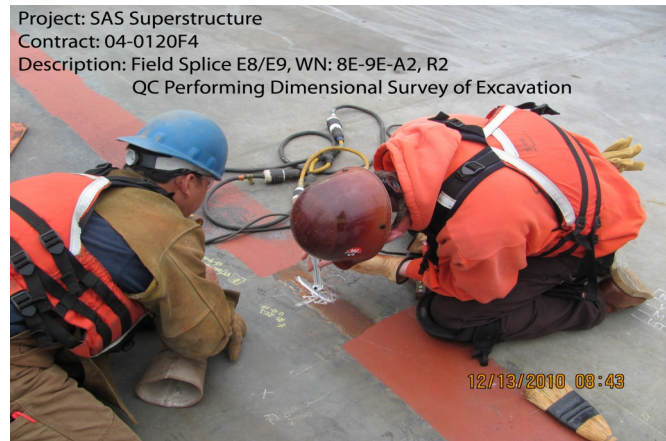
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The digital photographs below illustrate the work observed during this scheduled shift.



### Summary of Conversations:

There were general conversations with Quality Control Inspector Bonifacio Daquinag, Jr. at the start of the shift regarding the location of American Bridge/Fluor welding, inspection and N.D.E. testing personnel scheduled for this shift.

### Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy 510-385-5910, who represents the Office of Structural Materials for your project.

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<b>Inspected By:</b>	Reyes,Danny	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell,Bill	QA Reviewer

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